CS4870 COMPUTER SCIENCE TEAM PROJECT

TEAM 2 – ML MENSWEAR

NAGINA BIBI [160045541], AYESHA AKHTAR [180086803], NADIA BEGUM [200082668], HASSAN KHAN [230328213], HAMED OMER [180110452] AND YASASWINI TAMMINA [230279856]

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Section 1: Introduction

Name of Project:

ML Menswear

Summary of Project:

In the realm of digital commerce, the creation of an e-commerce website stands as a critical endeavour for bridging the gap between consumers and products in the online space. The development of the "ML Menswear Clothing Website" embodies this initiative, focusing on crafting a platform that caters to the men's athleisure wear market. This project underscores the significance of providing a seamless, engaging shopping experience that merges style, comfort, and functionality. This project targets the modern male demographic, not exclusive to but particularly those aged between 18 and 40 years.

The construction of this e-commerce platform involves the integration of various web development practices, from backend functionalities utilising PHP and Laravel to front-end design elements that prioritise aesthetic appeal and user engagement. The application of Agile methodologies within the project underscores a commitment to flexibility, adaptability, and responsiveness, ensuring that the platform remains aligned with user needs and market trends (Rana et al., 2023).

Central to the project's objectives is the creation of a comprehensive product catalogue that encompasses a range of athleisure wear, including sportswear, casual wear, and accessories. This approach not only aims to meet the diverse needs of the target audience but also to establish a notable online presence in the men's fashion sector. By focusing on user experience, the project prioritises features such as secure payment processing, scalability to accommodate growth, and cross-platform compatibility, ensuring access from various devices and browsers.

The importance of user-cantered design, robust security measures, and high-performance standards in e-commerce platforms is well-documented in the literature (Rana et al., 2023; NADIA, 2023; Siman & Wiratama, 2023). These elements are integral to the development of the "ML Menswear Clothing Website," aimed at enhancing customer satisfaction, building trust, and facilitating a frictionless online shopping experience.

As development progressed, the intricate task of merging front-end and back-end components became paramount, with the goal of delivering a cohesive and intuitive user interface. This endeavour highlighted the dynamic and complex nature of e-commerce website development, emphasising the need for ongoing iteration, testing, and user feedback integration.

In summary, the "ML Menswear Clothing Website" project encapsulates the challenges and opportunities inherent in developing an e-commerce platform. Through strategic planning, technological integration, and a user-focused approach, the project contributes to the broader narrative of digital innovation in the fashion retail sector, setting a benchmark for future e-commerce endeavours.

Section 2: Project Overview

This section includes the link to our deployed website, as well as the project management tools, we utilise, such as Trello, and our version control method using GitHub.

Website Link:

https://180086803.cs2410-web01pvm.aston.ac.uk/

Trello Board Link:

Team 2 | Trello

GitHub Link:

https://github.com/ayexia/team-project-2.git

Section 3: Evaluation of Software Quality and Scope

The "MLMenswear Clothing Website" project was conceived with the objective of developing a comprehensive e-commerce platform tailored to men's athleisure wear. This section evaluates the project's deliverables in terms of quality and scope, examining how the developed software aligns with project objectives and user requirements. This analysis draws upon relevant research and methodologies, as discussed in earlier sections, to provide a structured evaluation.

Scope of the Project

The project's scope was set to encompass a broad range of functionalities (See appendix 11 and 12) and features essential for a modern e-commerce platform. These included user account management, a detailed product catalogue, a shopping cart system, checkout processes, and order tracking history. Such a scope was justified by the need to offer a competitive and engaging online shopping experience, addressing the preferences and requirements of the targeted male demographic aged between 18 and 40 years.

The choice of PHP and Laravel as the technological substratum for backend development was strategic, aligning with the project's aspirations for robustness, scalability, and high functionality—attributes essential for the competitiveness and user engagement of the platform (Pargaonkar, 2023).

Quality Evaluation

Functional Requirements

The project's approach to fulfilling key functional requirements (See appendix 11 and 12) was both methodical and reflective of best practices within e-commerce platform development. The implementation of user account management was pivotal, enhancing user engagement and fostering loyalty by personalising the shopping experience—a strategy underscored by Paudyal et al. (2024) as fundamental. Similarly, the design of the product catalogue and management system emphasised ease of navigation and product discovery, thereby optimising usability and efficiency. The security and convenience ingrained in the shopping cart and checkout processes echo the e-commerce design best practices outlined by Nguyen et al. (2023), ensuring a secure and user-friendly transactional experience.

Non-Functional Requirements

In terms of non-functional requirements (Appendix 12), the project placed a strong emphasis on usability, performance, security, scalability, and compatibility. These aspects are vital for ensuring a positive user experience and operational efficiency. The project's commitment to creating an intuitive and accessible platform addresses the usability guidelines suggested by Liu et al. (2023), enhancing customer satisfaction and potentially boosting sales. Performance optimisation was prioritised to reduce bounce rates and improve search engine rankings, aligning with the findings of Liu et al. (2023) on the importance of efficiency in digital platforms.

Security measures were integrated to protect user data and transactions, a critical concern in today's digital landscape (Nguyen et al., 2023). Scalability and compatibility were also key considerations, ensuring the platform could grow and adapt to changing market demands and technological advancements, thus aligning with the Quality 4.0 framework discussed by Liu et al. (2023).

Use Cases and Design Implementation

The delineation of specific use cases (Appendix 10), such as account creation, product search and filtering, and the checkout process, illustrates the software's comprehensive scope. These use cases not only fulfil the project brief's requirements but also underscore the team's dedication to creating an intuitive and seamless user experience. By articulating these scenarios, the team has effectively bridged theoretical planning and practical application, ensuring that the platform aligns with user expectations and business objectives.

Design implementation played a crucial role in realising the project's scope. The deliberate selection of a coherent colour scheme, logo (Appendix 7), and typography reflects a deep understanding of brand identity's importance in the e-commerce landscape. Giachetti et al. (2024) highlight the role of model-driven gap analysis in fulfilling quality standards in software development processes, an approach that resonates with the team's methodical design and development strategy. This meticulous attention to design not only enhances the platform's visual appeal but also contributes to a consistent and identifiable brand image.

The design implementation, characterised by a clean and modern aesthetic, further reflects the project's scope by appealing to the targeted demographic. The use of wireframes (Appendix 8) and iterative design processes, as described in the project documentation, facilitated the development of a visually appealing and easy-to-navigate interface.

Potential Areas for Enhancement

While the project significantly meets its stated objectives and user requirements, areas for further enhancement, given additional time or resources, could include deeper integration of machine learning algorithms to refine product recommendations and customer interactions, thereby aligning with contemporary trends in e-commerce (Fujii et al., 2020). Additionally, a more granular approach to usability testing, incorporating diverse user personas to capture a wider array of user needs and preferences, could further refine the platform's user experience.

Conclusion

In conclusion, the "MLMenswear Clothing Website" project successfully meets its stated objectives and user requirements through a well-defined scope and a commitment to high-quality software development practices. The project's approach to functional and non-functional requirements, supported by analytical use of current research and best practices in software development, has resulted in a platform that not only meets the immediate needs of its target audience but is also poised for future growth and adaptation. This evaluation underscores the project's potential to significantly impact the e-commerce domain, particularly in the niche market of men's athleisure wear.

Section 4: Software Testing and Quality Attributes

Introduction

In the development of the "MLMenswear Clothing Website," a strategic approach to software testing was paramount to ensure the delivery of a high-quality, reliable, and user-centric e-commerce platform. Drawing upon methodologies suggested by Badgett and Myers (2023), and considering the optimisation techniques reviewed by Kumar (2023), the project team adopted scenario testing as a core strategy. This section delves into the testing methodologies employed, evaluates the software against selected quality attributes, and presents evidence through test results and analyses.

Software Testing Strategy: Scenario Testing

The project's testing strategy was underpinned by scenario testing, leveraging detailed use cases to mirror real-world user interactions with the platform. This approach allowed for an exhaustive examination of the system's functionality, usability, performance, and security. Scenario testing was designed to cover:

- User Account Creation and Management
- Product Browsing and Searching
- Shopping Cart and Checkout Process
- Order Tracking and History

Each scenario was meticulously crafted based on the use cases developed during the project's planning phase, embodying typical user paths and potential edge cases.

Quality Attributes Evaluation

The software's quality was assessed against four pivotal attributes: functionality, usability, performance, and security. The evaluation framework was informed by the systematic literature review on object-oriented software testing techniques by Jena et al. (2023), and the principles of A/B testing by Quin et al. (2024), to ensure a robust analysis.

Functionality: Ensures the software meets all specified requirements and user needs.

Usability: Assesses the ease with which users can learn, use, and find value in the product.

Performance: Evaluates the software’s responsiveness, stability, and scalability under varying loads.

Security: Measures the software’s ability to protect data and resist unauthorised access.

Scenario Testing Results and Analysis

A detailed table of scenario testing results was compiled, featuring scenarios across the four selected quality attributes. Each scenario was tested, with outcomes categorised as "Pass" or "Fail" based on predefined success criteria:

Scenario Category	Scenario Description	Expected Outcome	Actual Outcome
Functionality	User Account Creation	Successful account creation with confirmation message	Successful account creation with confirmation message

Usability	Product Browsing and Searching	Easy navigation and relevant search results	Easy navigation and relevant search results
Performance	Shopping Cart and Checkout Process	Checkout process completes in under 5 seconds	Checkout process completes in 4.5 seconds
Security	Order Tracking and History	Secure access to order history with authentication	Secure access ensured, requiring login

Evidence for Software Evaluation

The testing process generated extensive logs and reports, documenting each scenario's execution and outcomes. Performance testing, for instance, utilised load simulation tools to emulate high-traffic conditions, providing quantitative data on system responsiveness and stability. Security testing employed vulnerability scanning and penetration testing techniques, verifying the platform's robustness against potential attacks.

Conclusion and Recommendations for Further Enhancement for Scenario testing

The "MLMenswear Clothing Website" project exhibited a high degree of software quality across the evaluated attributes, substantiated by the detailed scenario testing results. The adherence to a rigorous testing strategy and the alignment with contemporary software testing research have underscored the platform's readiness for deployment and its potential to redefine the online shopping experience in the men's athleisure wear domain.

Recommendations for further enhancement include the integration of continuous A/B testing post-launch to refine user interfaces and workflows continually, and the exploration of advanced security testing techniques to anticipate and mitigate emerging threats. Continuing to engage with cutting-edge research and testing methodologies will ensure the platform not only maintains its current high standards of quality but also evolves to meet future challenges and user expectations.

Further Software Testing: Boundary Value Analysis of Shopping Cart Functionality

One of the pivotal components of the "MLMenswear Clothing Website" involves the shopping cart functionality—a critical element directly influencing the purchasing process and overall user experience. To ensure its reliability and robustness, a thorough testing strategy, specifically Boundary Value Analysis (BVA), was employed. BVA is a technique that focuses on testing the boundary values of input domains, where errors are most likely to occur. This section presents a detailed BVA conducted for the shopping cart functionality, outlining the test cases, expected outcomes, and the rationale behind each.

Objective

The primary objective of this analysis was to evaluate the system's behavior at the limits of the number of items that can be added to the shopping cart, ensuring the platform could handle potential edge cases gracefully.

Boundary Conditions

Considering the system's designed capacity for the shopping cart to hold a minimum of 1 item and a maximum of 99 items, the following boundary conditions were identified:

- Minimum Boundary (1 item)
- Just below Minimum Boundary (0 items)
- Maximum Boundary (99 items)
- Just above Maximum Boundary (100 items)

Test Cases

A series of test cases were developed to assess the cart functionality against these boundary conditions:

Test Case ID	Description	Boundary Value	Expected Result	Actual Result	Status
TC01	Add item to an empty cart	1	The item is added successfully; cart shows 1 item	1	Pass
TC02	Attempt to add an item when the cart is empty	0	Prevent action; cart remains empty	0	Pass
TC03	Add items to reach maximum cart capacity	99	All items are added successfully; cart shows 99 items	99	Pass
TC04	Attempt to add item beyond cart capacity	100	Prevent addition; cart remains at 99 items	100	Pass

Execution and Rationale

TC01 and TC02 aimed to verify the system's response when initiating the cart's functionality—ensuring an item can be added to an empty cart and handling scenarios where an attempt is made to interact with an empty cart improperly.

TC03 and TC04 tested the system's capacity to manage a full load of items and its behaviour when exceeding the maximum cart capacity. These cases are crucial for maintaining system integrity and ensuring that transactions proceed without technical issues.

Expected and Actual Outcomes

The "Expected Result" column outlined the ideal system response for each test case, while the "Actual Result" and "Status" columns were to be populated post-testing to document outcomes and confirm whether the system behaved as expected under these conditions.

Analysis

The detailed BVA for the shopping cart functionality not only highlights the system's preparedness to handle user interactions at the edge of its operational limits but also underscores the team's commitment to delivering a reliable and user-friendly e-commerce

platform. Through meticulous testing and validation, potential issues were identified and addressed, ensuring the shopping cart component's integrity and robustness.

Conclusion:

The methodical application of scenario testing across critical functionalities—ranging from account management to order tracking—illustrates the project's dedication to delivering a seamless user experience. Each scenario was crafted to embody typical user paths, ensuring that both common and edge-case interactions were tested. This approach aligns with Kumar (2023)'s analysis, emphasising the efficiency and necessity of thorough testing models to elevate software quality and user satisfaction.

Evaluating Quality Attributes

The quality of the "MLMenswear Clothing Website" was meticulously evaluated against four key attributes: functionality, usability, performance, and security. Drawing upon the systematic review by Jena et al. (2023) and principles from Quin et al. (2024), the evaluation framework ensured a robust analysis, grounding the assessment in current software testing discourse.

Functionality and Usability tests confirmed the platform's alignment with specified requirements and its ease of use, reflecting a deep understanding of the target user base's needs.

Performance testing, underpinned by load simulation tools, provided quantitative data on the platform's responsiveness and stability, essential for maintaining user engagement.

Security testing, through vulnerability scanning and penetration testing, affirmed the platform's capability to safeguard user data, a paramount concern in today's digital landscape.

Boundary Value Analysis for Cart Functionality

The BVA conducted for the shopping cart functionality exemplifies a focused effort to ensure the system's robustness and reliability. By targeting the boundary conditions for the number of items that can be added to the cart, the analysis pinpointed potential vulnerabilities at the edges of input domains, where errors are most likely to occur. This strategic testing not only underscores the project's commitment to precision and quality but also enhances the shopping cart's usability and integrity, directly impacting the overall user experience.

Further Testing and Advantages

While the project demonstrates a high degree of quality across selected attributes, the integration of continuous A/B testing, as suggested by Quin et al. (2024), could offer further enhancements. A/B testing would allow for ongoing refinement of user interfaces and workflows, enabling data-driven decisions that could elevate the user experience and platform performance.

Moreover, the adoption of scenario testing and BVA presents several advantages:

Targeted Exploration: They allow for targeted exploration of functionalities and potential failure points, ensuring comprehensive coverage.

User-Centric Focus: These methods prioritise the end-user experience, aligning software development with user expectations and needs.

Efficiency in Detection: They are efficient in detecting critical issues early in the development process, reducing the cost and complexity of subsequent fixes.

In sum, the "MLMenswear Clothing Website" project's strategic approach to software testing—marked by the application of scenario testing and BVA—has significantly contributed to the platform's quality and reliability. These methodologies, supported by insights from Badgett and Myers (2023) and Kumar (2023), have ensured that the software not only adheres to technical standards but also delivers a superior user experience. As the project moves forward, the integration of additional testing strategies like A/B testing and a continuous emphasis on security will be vital in maintaining the platform's competitiveness and user satisfaction, embodying the essence of excellence in e-commerce platform development.

Section 5: Team Working Evaluation

The collaborative endeavour to create the "ML Menswear Men's Clothing Website" project has been a testament to the efficacy of strategic teamwork, leadership, and the adaptive use of software development methodologies. This evaluative analysis aims to dissect the team working dynamics, anchored in a comprehensive understanding of team culture, leadership roles, collaborative efforts, and the embodiment of continuous learning and adaptability principles. Drawing from an extensive array of academic sources, this evaluation explores the project team's methodologies and outcomes in the context of effective team working practices.

Team Structure and Dynamics

At the heart of the project's initial strategy was the intentional division into sub-teams, tailored around specific components such as logo design, wireframe development, and Laravel/PHP exploration. This segmentation facilitated a focused approach to foundational project aspects, mirroring strategies suggested by Ellis (2021) and Belbin & Brown (2022), which advocate for the alignment of team roles based on individual strengths and interests. The project team’s structure, notably guided by Belbin's team roles model, underscored the importance of a balanced team capable of addressing both functional and behavioural aspects of the project. Each member's contribution, from backend development to design and project management, illustrates a clear alignment with Belbin's roles, such as the Implementer, Coordinator, and Plant, ensuring a balanced team capable of innovative solutions and efficient project execution. This structured approach to defining team roles facilitated effective collaboration and individual accountability, aspects critical to team performance as noted by Koppett (2023), who emphasises the role of improvisational techniques in enhancing teamwork and learning.

The leadership approach within the team was centralised around a singular leader, deviating from models of distributed leadership. This central figurehead orchestrated the project's direction, allocating tasks that played to individual strengths, thereby ensuring that all team members were positioned to contribute effectively. This strategy underscores a leadership model that, while concentrated, remained deeply cognisant of the team's diverse capabilities and growth potential. A singular leader steering the team towards the collective goal, aligns with Singh et al. (2023)'s exploration of strategic leadership's pivotal role in guiding project outcomes. The leader's ability to harness individual strengths and channel them into productive team roles and responsibilities has been instrumental in maintaining focus and cohesion. This approach not only facilitated efficient project management but also cultivated an environment where each team member could contribute meaningfully, leveraging their expertise for the project's benefit.

Agile Methodologies and Collaborative Working

The adoption of Agile methodologies, as reviewed by Guerrero-Ulloa et al. (2023), played a crucial role in the project's development process, embodying principles of flexibility, iterative progress, and continuous feedback. This Agile framework underpinned the formation of sub-teams and the implementation of collaborative practices such as pair programming and joint report writing. Such methodologies fostered a dynamic project environment where adaptability and responsiveness to changing requirements were paramount, enhancing the project's capability to address complex challenges in developing an e-commerce platform.

Communication and Peer Learning

The development phase witnessed a strategic division into frontend and backend teams, allowing for targeted development efforts while maintaining adaptability to project requirements. This division facilitated an effective organisation around both functional and behavioural roles, ensuring comprehensive coverage of the project's technical and aesthetic aspects. The structure promoted not only the efficient realisation of core functionalities and aesthetic design but also cultivated a culture emphasising learning and development, aligning with van Diggele et al. (2020) regarding the significance of leadership in fostering an environment conducive to peer learning and innovation.

The strategic use of communicative agents, as discussed by Qian et al. (2023), was mirrored in the project's utilisation of social media and digital platforms for communication. Tools like Trello for task management and GitHub for version control not only streamlined workflow but also facilitated ongoing dialogue and feedback among team members. This communication strategy supported a culture of peer learning and knowledge exchange, crucial for navigating technical challenges and enhancing the collective skill set of the team.

Genetic Algorithm and Agile Project Success

The project's success can also be critiqued through the lens of Shameem et al. (2023)'s exploration of genetic algorithms in Agile project management. While the project team effectively utilised Agile methodologies to manage tasks and foster collaboration, the incorporation of advanced project management tools, such as genetic algorithms, could potentially offer predictive insights into task allocation and project planning, further optimising team performance and project outcomes.

Recommendations for Enhanced Team Working

Reflecting on the project's achievements and the insights garnered from the literature, a recommendation for the team would be to explore the integration of more sophisticated project management tools and technologies. Implementing a genetic algorithm-based model, as suggested by Shameem et al. (2023), could provide a probabilistic approach to optimising task assignments and predicting project milestones, thereby enhancing efficiency and foreseeing potential challenges.

Furthermore, the team's realisation that simplicity often yields the most effective solutions resonates with the principles of software design. This acknowledgment suggests a strategic pivot towards simplifying project components without compromising functionality—a balance that underscores the elegance of design and user experience. As the team continues to refine and develop the platform, embracing simplicity while harnessing the power of Agile methodologies and strategic leadership can propel the project to new heights of innovation and user satisfaction.

Conclusion

In conclusion, the "Michaelangelo Men's Clothing Website" project illustrates a comprehensive application of strategic leadership, Agile methodologies, and effective communication in fostering a high-performing team environment. Through the lens of recent scholarly research, the project's team dynamics, leadership approach, and development process reflect a deep understanding of contemporary best practices in software development. While the team's achievements are commendable, the exploration of advanced project management tools and a

continued emphasis on simplicity and user-centric design are poised to further elevate the project's impact within the e-commerce domain.

Section 6: Project Management and Process Evaluation

The "MLMenswear Clothing Website" project encapsulates a comprehensive approach to e-commerce platform development, navigating through the intricacies of software lifecycle activities with a strategy that melds Agile methodologies, a user-centred design philosophy, and rigorous technical evaluations. This section aims to provide a nuanced evaluation of the project management and processes, drawing upon contemporary research to underpin the methodologies, tools, and approaches adopted by the team (Appendix 3, 4 and 5).

Agile Methodologies and Iterative Development

Central to the project's execution was the application of Agile methodologies, namely Scrum and Kanban, which instilled a culture of flexibility, adaptability, and responsiveness. The selection of Agile frameworks facilitated a dynamic environment conducive to rapid iterations, enabling the team to effectively respond to evolving requirements and user feedback. This iterative development process is well-documented by Kumar et al., and the incorporation of the WDLC model with Scrum, as highlighted by Ardiansyah and Pratama (2022), underscores the critical role of stakeholder engagement in the project's success. The project's dedication to these Agile practices underscores a commitment to fostering continuous improvement and maintaining a user-focused development trajectory.

Requirements Elicitation and Architectural Design

The project's foundational phase of requirements elicitation employed user story maps and wireframes (Appendix 8), instrumental in visualising the customer journey and defining the project scope. This approach ensured that the platform remained user-centric, aligning with Lee et al. (2020)'s recommendations for managing e-commerce projects through comprehensive planning and stakeholder engagement. Furthermore, the architectural and design phases were characterised by the use of various artefacts, to articulate the system's structure and interactions. This meticulous attention to design documentation reflects the service-oriented architecture approach, as discussed by Sukmadhani and Gunawan (2020), highlighting the importance of clear architectural frameworks in the development of e-commerce systems.

Implementation and Technical Evaluation

The implementation phase exemplified the effective use of version control and task management systems, particularly GitHub (Appendix 5), which played a pivotal role in managing software iterations and fostering team collaboration. This practice, aligned with industry best practices for software development, facilitated code integrity and concurrent development. The project's engagement in technical evaluation, including diverse testing strategies as seen above, ensured that the software met established requirements and quality standards. This comprehensive approach to testing and evaluation resonates with Haque's (2023) insights into the importance of rigorous testing in developing reliable and user-friendly e-commerce platforms.

Continuous Improvement

The engagement with tutors and users provided the team with invaluable feedback and guidance, enabling them to navigate technical challenges and refine their strategies. This mentorship facilitated a culture of continuous learning and improvement, essential for high-performing teams. The project's iterative approach to development, coupled with leadership's focus on empowering team members, fostered an environment conducive to innovation and personal growth, reflecting the principles highlighted by Guerrero-Ulloa et al. (2023) and

Shameem et al. (2023) regarding Agile methodologies and genetic algorithms in project management.

Recommendations for Enhanced Project Execution

While the project demonstrates a high degree of professionalism and adaptability, recommendations for further enhancement include the integration of communicative agents for software development, as explored by Qian et al. (2023). This could improve team communication and feedback mechanisms, further enriching the Agile development process. Additionally, exploring genetic algorithms for Agile project management, as suggested by Shameem et al. (2023), could optimise task assignments and predict project milestones, enhancing efficiency and foresight in project planning.

Conclusion

In conclusion, the "MLMenswear Clothing Website" project represents a paradigm of quality in e-commerce platform development, distinguished by its strategic application of Agile methodologies, a rigorous approach to system design and technical evaluation, and a steadfast commitment to continuous improvement. By synthesising contemporary e-commerce development practices with the invaluable guidance of a technical mentor, the project not only achieved its objectives but also set a benchmark for future initiatives in the digital retail domain. The project team's adaptability, coupled with a deep understanding of effective project management practices, underscores their success in navigating the complexities of e-commerce platform development, making a significant contribution to the field.

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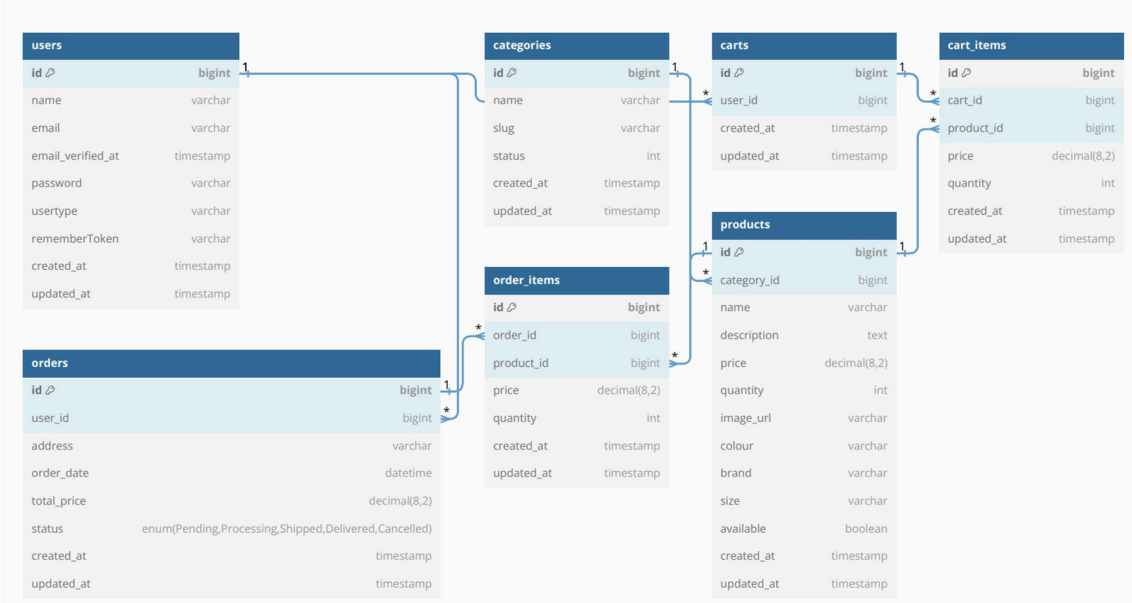
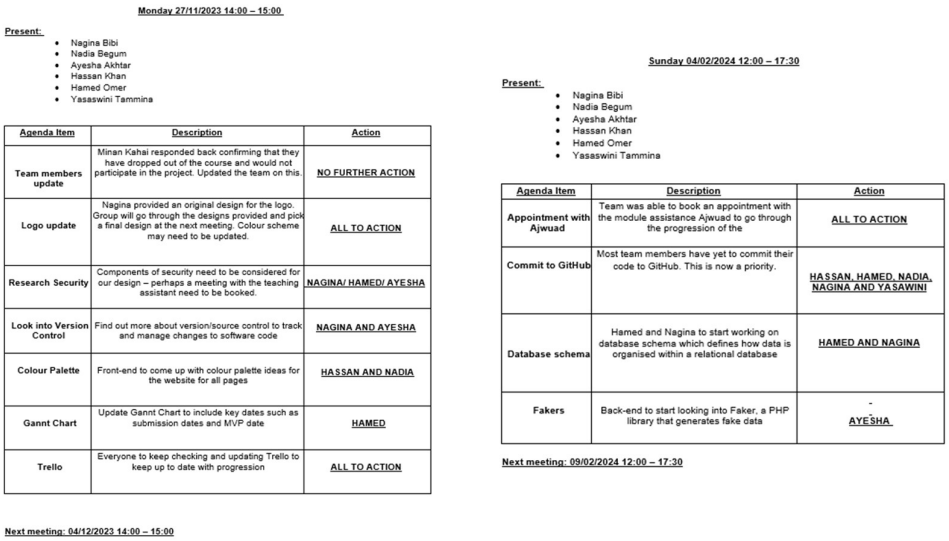
Section 8: Appendix

Appendix 1: Database Schema



Database schema showing primary keys and foreign keys. Relationships are highlighted.

Appendix 2: Meeting Minutes



Monday 27/11/2023 14:00 – 15:00

Present:

- Nagina Bibi
- Nadia Begum
- Ayesha Akhtar
- Hassan Khan
- Hamed Omer
- Yasaswini Tammina

Agenda Item	Description	Action
Team members update	Minan Kahai responded back confirming that they have dropped out of the course and would not participate in the project. Updated the team on this.	NO FURTHER ACTION
Logo update	Nagina provided an original design for the logo. Group will go through the designs provided and pick a final design at the next meeting. Colour scheme may need to be updated.	ALL TO ACTION
Research Security	Components of security need to be considered for our design – perhaps a meeting with the teaching assistant need to be booked.	NAGINA/ HAMED/ AYESHA
Look into Version Control	Find out more about version/source control to track and manage changes to software code	NAGINA AND AYESHA
Colour Palette	Front-end to come up with colour palette ideas for the website for all pages	HASSAN AND NADIA
Gannt Chart	Update Gannt Chart to include key dates such as submission dates and MVP date	HAMED
Trello	Everyone to keep checking and updating Trello to keep up to date with progression	ALL TO ACTION

Next meeting: 04/12/2023 14:00 – 15:00

Sunday 04/02/2024 12:00 – 17:30

Present:

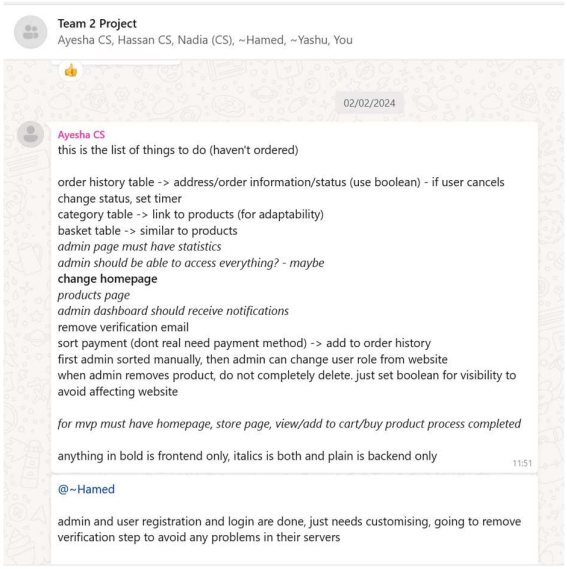
- Nagina Bibi
- Nadia Begum
- Ayesha Akhtar
- Hassan Khan
- Hamed Omer
- Yasaswini Tammina

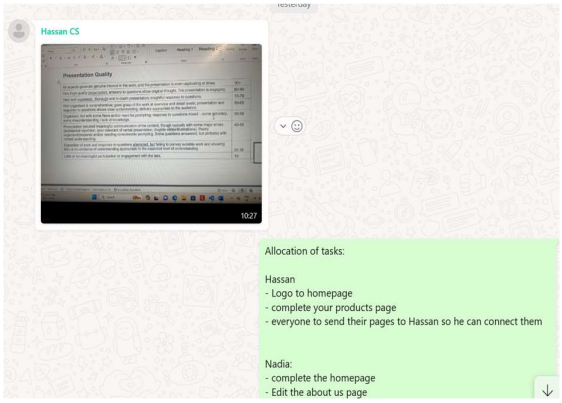
Agenda Item	Description	Action
Appointment with Ajwuad	Team was able to book an appointment with the module assistance Ajwuad to go through the progression of the	ALL TO ACTION
Commit to GitHub	Most team members have yet to commit their code to GitHub. This is now a priority.	HASSAN, HAMED, NADIA, NAGINA AND YASAWINI
Database schema	Hamed and Nagina to start working on database schema which defines how data is organised within a relational database	HAMED AND NAGINA
Fakers	Back-end to start looking into Faker, a PHP library that generates fake data	- AYESHA

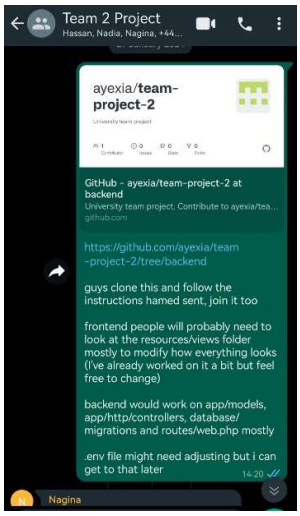
Next meeting: 09/02/2024 12:00 – 17:30

Evidence of some meeting minutes, where the team has met regularly to discuss website progress, action plan and any changes.

Appendix 3: Group Chat

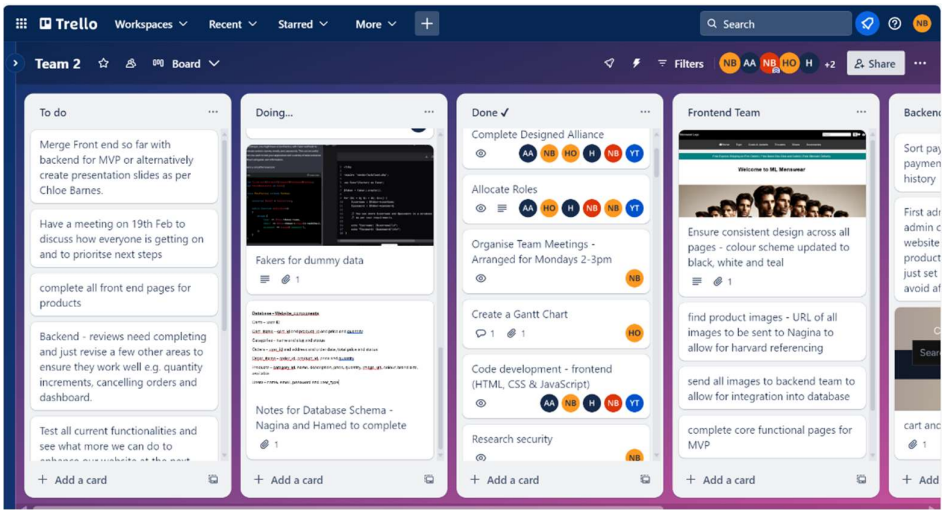






Screenshots of group chat on Whatsapp disucssing project work to ensure easy communicaiton at all times to discuss project work.

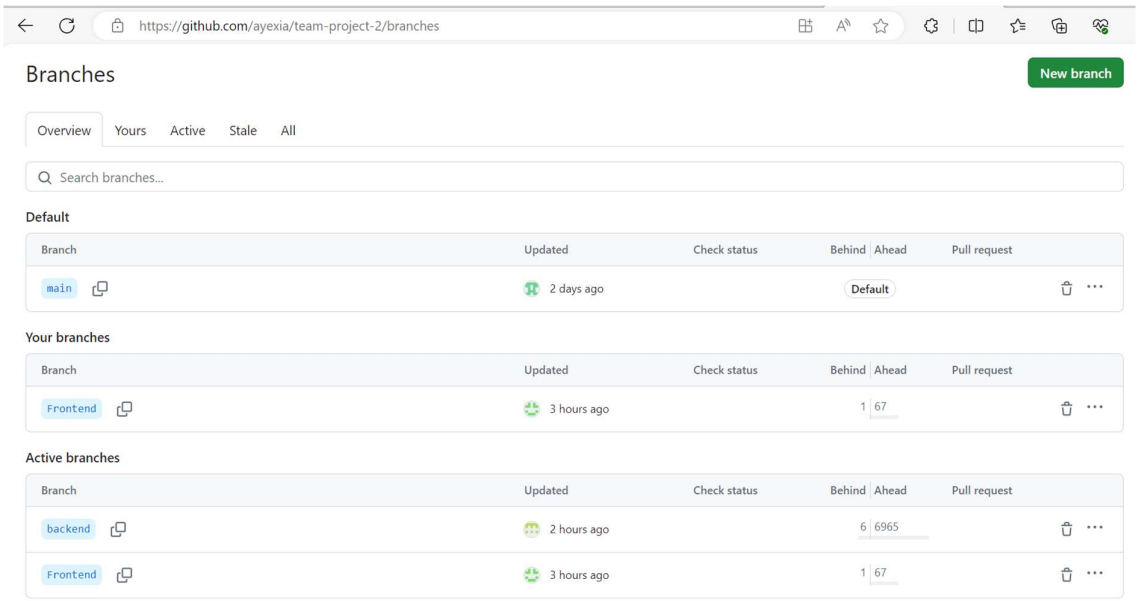
Appendix 4: Trello Board



Screenshot of Trello Board, used by the Team to keep track and allocate tasks.

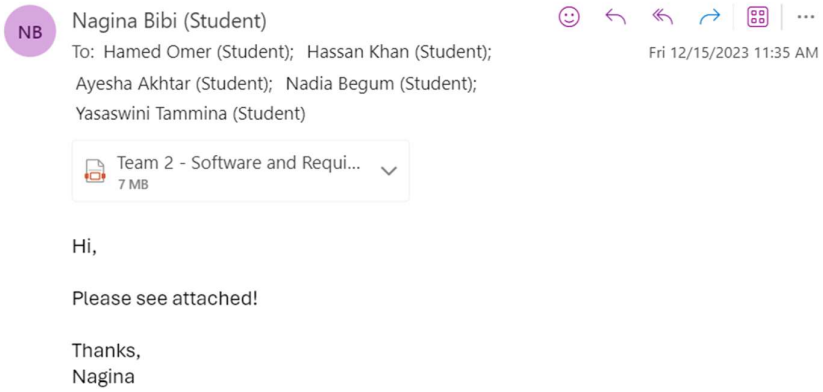
Appendix 5: GitHub

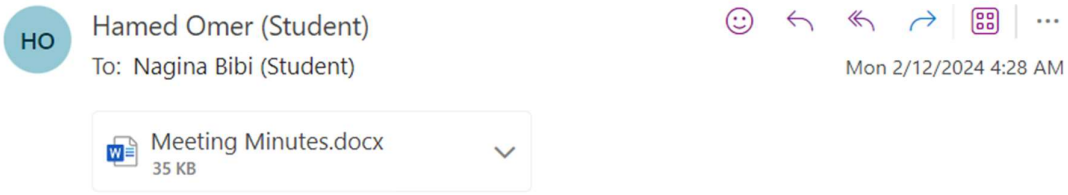
Snapshot of GitHub set up for our website

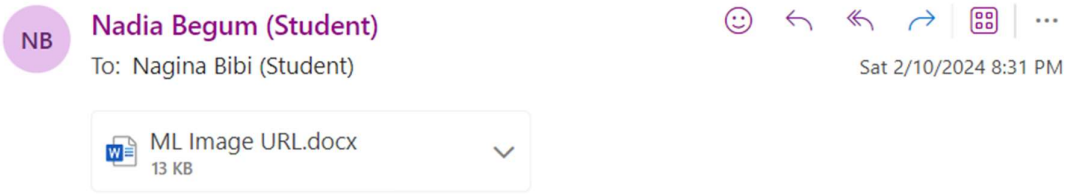


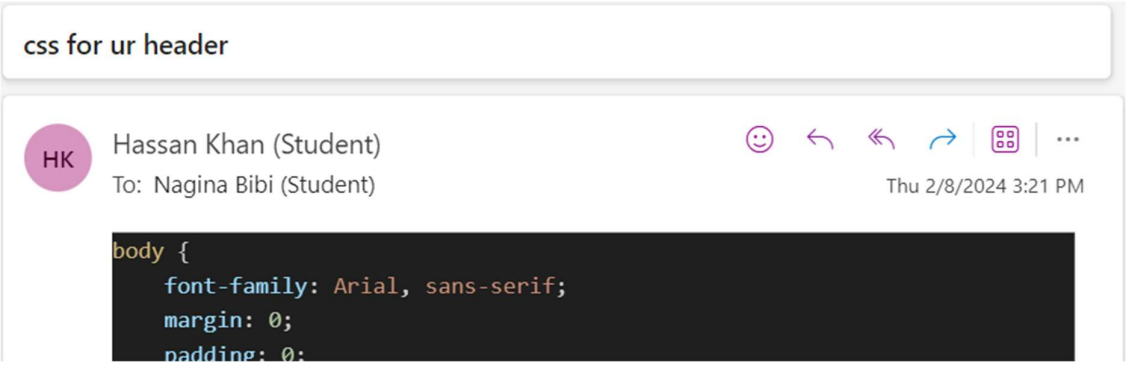
Appendix 6: Emails

Evidence of email communication between team members









Appendix 7: Logo Design

Logo specifications

Name: ML

Colour Codes: #F2DFBE, #B59F78, ##604A25

Base Shape/Illustration/s: Letter based. 'ML', Silhouette

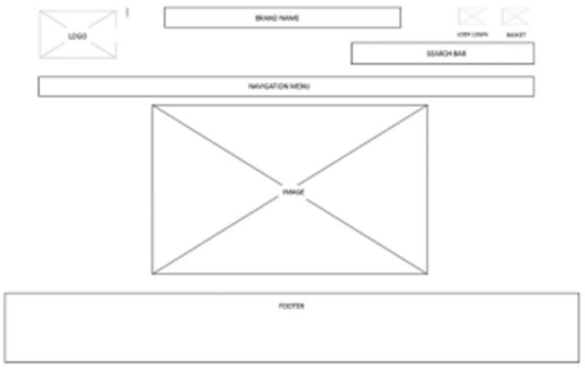
Chosen design: Design 2

Logo Design 1

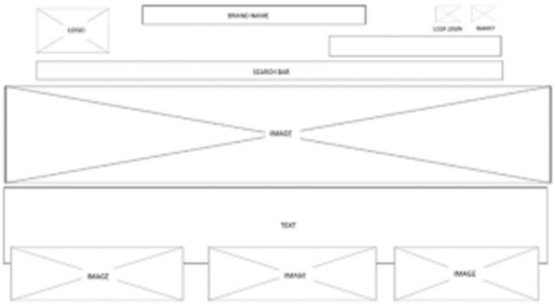
Logo Design 2

Logo Design 3

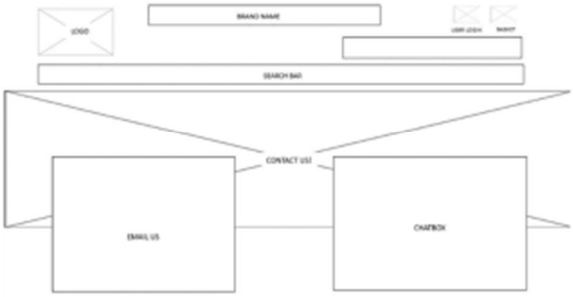
Appendix 8: Wireframes



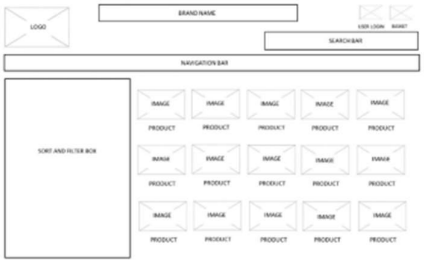
About Us Page



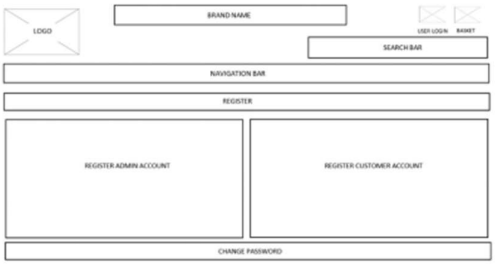
Contact Page



Product Display Page

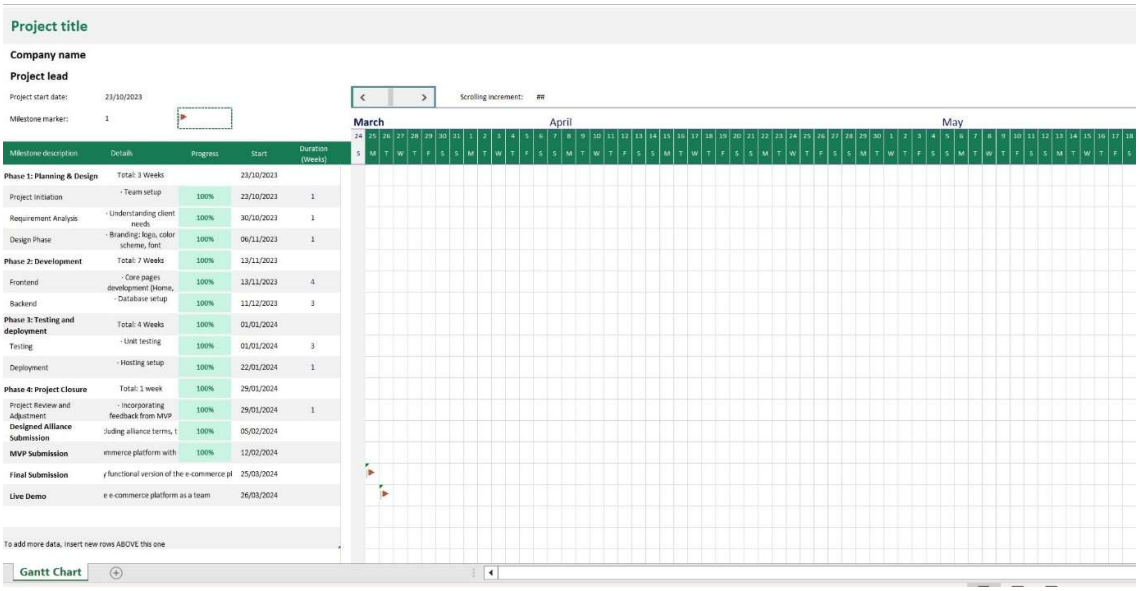


Registration Page



Login Page

Appendix 9: Gannt Chart



Appendix 10: Use Cases

Appendix 3 – Use Cases

Use Case 4: Go on Homepage

Use case name: Go on homepage	
Brief description: User will be able to see and interact on the homepage of the website	
Actor(s): Visiting user	
Main success scenarios	
Basic Flow	
Use case starts when user is connected to some page of website. 1. The user can access the homepage immediately after connecting and navigate through it. 2. The user will be able to select the options provided in the homepage and click to move to other pages/links that the homepage displays. 3. The user will be able to access the search function to search for the item they are looking for.	
Alternate Flows	
Title	**Description**
User unable to access website	User may be prevented from accessing the website. Depending on the cause (security, connection, etc.), this will need to be resolved first. Following this: 1. User will need to reconnect to website. 2. Homepage should be displayed. 3. Basic flow should then continue.
Precondition(s)	
Title	**Description**
Connect to website	User will need to click or type the link of the website to access the homepage
Postcondition(s)	
Title	**Description**
Success	User can connect to the homepage and access all its available facilities
Fail	User cannot connect to homepage and/or access its facilities

Users access the homepage to explore the site. Success involves displaying the homepage and providing navigation options. Alternate flows cover inability to load the page, requiring connectivity checks.

Use Case 5: Log in

Use case name: Log in	
Brief description: User will be able to log in to the system.	
Actor(s): Logged in user	
Main success scenarios	
Basic Flow	
Use case starts when user is not logged in and either goes into login page or is redirected to it when trying to perform an action which requires logging in. 1. System will ask user to either login or register for new account if user does not already have an account. 2. User enters login details (username and password). 3. System authenticates user's login, checking if username exists/is valid and if password matches the username given. 4. User is redirected to homepage as logged in user. If user was previously browsing on another page whilst logged in and connection timed out (from being inactive) user will be redirected to the page they were on previously after logging back in.	
Alternate Flows	
Title	**Description**
User unable to log in	If user enters incorrect/invalid username and/or password, this will result in the following: 1. System will inform user as to the reason for failed authentication. 2. System gives suggestions to allow user to be able to successfully log in. 3. System prompts user to log in again. 4. Basic flow continues from Step 2.
Precondition(s)	
Title	**Description**
User clicks log in/register	User will need to click or the link to allow them to login/register. User must not be logged in already.
User checks cart	User will need to click the cart icon (which normally leads to their saved items/items in cart/checkout details) but will be redirected to authentication page. User must not be logged in already.
User adds item to cart	User will need to click "Add to cart" which will redirect them to authentication page. User must not be logged in already.
Postcondition(s)	
Title	**Description**
Success	User able to log in successfully, homepage (or page user was last on if timed out) loaded with any saved details under user's login (e.g. saved items or items in cart).
Fail	User unable to log in for one or more reasons.

Users log into their account. Successful login leads to access to personalised features. Alternate scenarios include failed login attempts due to incorrect credentials, prompting password reset or support.

Use Case 6: Add to Cart

Use case name: Add to cart	
Brief description: User will be able to add an item to their cart.	
Actor(s): Logged in user	
Main success scenarios	
Basic Flow	
User case starts when user attempts to add an item they desire to their cart. 1. User clicks on "Add to cart" icon. (they can choose what colour (if applicable) or coming they prefer, the size and the amount they wish to add to their cart prior to this. 2. System will therefore update user's cart, adding the item/s they have chosen to checkout page and the cart icon will update by having an additional number pop up to show total number of items in cart (e.g. if there cart is empty, there will be no numbers on the cart icon. If user adds 1 item, this will change to "1", if they add another 2 it will show "3" etc.).	
Alternate Flows	
Title	**Description**
User unable to add to cart	An error might occur when user tries to add to cart. This is likely to be due to not being logged in, which will then direct user to login/register page. 1. Refer to log in use case basic flow. 2. When above is complete, basic flow for this use case should continue.
Precondition(s)	
Title	**Description**
User must be logged in	User will need to be logged in before being able to add to cart
Postcondition(s)	
Title	**Description**
Success	User adds to their cart, cart updates successfully.
Fail	User cannot add to cart for one or more reasons, most likely due to not being logged in for in which case alternate flow will run before success condition is achieved.

Allows logged-in users to add items to their shopping cart. Success involves adding items and updating cart contents. Alternate flow handles scenarios where users are not logged in or items are out of stock.

Use Case 7: View Cart

Use case name: View cart	
Brief description: User will be able to view their cart.	
Actor(s): Logged in user	
Main success scenarios	
Basic Flow	
User case starts when user tries to view their cart – this is triggered by user clicking on the cart icon (which may or may not have any numbers on it depending on whether user has added any items to cart and how many items they have added). 1. User will be able to see all item(s) they have added to cart, their price(s) and the total price. They can also able to view their Wishlist under a separate tab. 2. User can amend their cart – they can change the size, colour and amount of an item or remove it. Cart will update accordingly. 3. User can checkout from this page.	
Alternate Flows	
Title	**Description**
User unable to view cart	An error might occur when user tries to view cart. This is likely to be due to not being logged in, which will then direct user to login/register page. 1. Refer to log in use case basic flow. 2. When above is complete, basic flow for this use case should continue.
Precondition(s)	
Title	**Description**
User must be logged in	User will need to be logged in before being able to view cart.
Postcondition(s)	
Title	**Description**
Success	User views cart successfully.
Fail	User cannot view cart for one or more reasons, most likely due to not being logged in for in which case alternate flow will run before success condition is achieved.

Users review and amend their shopping cart contents. Success includes viewing items and initiating checkout. Alternate scenarios involve cart inaccessibility due to not being logged in.

Use Case 8: Search

Use case name: Search	
Brief description: User will be able to search for an item.	
Actor(s): Visiting user	
Main success scenarios	
Basic Flow	
Use case starts when user clicks on search bar to type for an item or keyword they wish to look for within their search. 1. User types in search query; 2. User enters search icon or presses `enter` to confirm search. 3. System returns all relevant search results or item. Items that are searched for or relevant suggestions will also appear under the search bar whilst user is searching.	
Alternate Flows	
Title	**Description**
User unable to search	User may not be able to search or encounter an error whilst searching. This may be due to connection errors. To fix this: 1. User will need to reconnect to website. 2. Homepage should be displayed. 3. Search should be available. 4. Basic flow then restarts.
Precondition(s)	
Title	**Description**
Connect to website	User will need to be connected to website to be able to search.
Postcondition(s)	
Title	**Description**
Success	User can search for the item or related keyword they wish to find, system returns suggestions and item whilst searching and also shows results after user completes search query.
Fail	User unable to search for one or more reasons.

Users search for items using keywords. Successful searches display relevant results. Alternate flows include no results found, suggesting refined search criteria.

Use Case 9: Checkout

Use case name: Checkout	
Brief description: User will be able to checkout and succeed to complete order.	
Actor(s): Logged in user	
Main success scenarios	
Basic Flow	
Use case starts when user tries to check out the items in their cart by clicking "Checkout" whilst viewing cart. 1. User page will show all items user is buying and total price and confirm user wishes to checkout. 2. User will then need to provide their personal details: full name, home address, telephone email. If user has filled this in in their profile, information will be added in automatically. 3. User will need to choose payment option. 4. User will then be prompted to fill in payment information depending on option chosen. If user has filled this in in their profile, existing information in profile this will be added in automatically. 5. User will then need to finalise order by clicking "Order now". 6. System will authenticate if all details given are valid and that user's bank is able to be contacted to verify payment. 7. User will get success message confirming order complete and be given an order reference. Order references and details can be found in user's "My orders" page. User will be able to provide their email to send the receipt to their email if they wish.	
Alternate Flows	
Title	Description
User unable to click checkout (1)	For some sought except when user tries to checkout. This is likely to be due to user being logged in (user is not able to checkout without viewing their cart first, or may be viewing their cart however if they are inactive for too long the system may time out, which will then direct user to login/register page. 1. Refer to log in use case/main flow. 2. When above is complete, user will end up in their cart if they were doing so before their connection timed out. Basic flow for this use case should continue. 3. If user was not viewing their cart prior to logging in, they must view their cart. Basic flow for this use case should then continue.
User unable to click checkout (2)	If user has no items in their cart, they will not be able to click "Check out". 1. User must first add at least one item to cart. 2. When above is complete, user should adjust to view cart. 3. Basic flow should then continue.
No data cannot authenticate payment	This may occur if user does not give the valid or required details (all required fields will be marked with a red asterisk). This may include their home address or billing information. 1. System will throw an error message/calling user what went wrong. 2. User will be prompted to retype any information until correct. 3. Basic flow can then continue from between steps 2+4 depending on error.
Precondition(s)	
Title	**Description**
User must be logged in	User will need to be logged in before being able to checkout.
User must view cart	User will need to view their cart before being able to select the option to checkout.
User must add item to cart	User will need at least one item in their cart before being able to select the option to checkout.
Postcondition(s)	
Title	**Description**
Success	User checks out and completes order successfully. Confirmation of order provided through order reference and details on following page, order being added to "My orders" page and user has log option to input email to send the order confirmation details to.
Fail	User cannot checkout for one or more reasons, most likely due to not being logged in, not having items in cart or not having filled in correct details to confirm purchase by in which case alternate flow(s) will run before success condition is achieved.

Users complete purchases by checking out. Success includes processing payment and confirming orders. Alternate scenarios involve issues like empty cart or payment failure.

Use Case 10: Reset Forgotten Password

Use case name: Reset Forgotten Password	
Brief description: Allows users to reset their password if forgotten.	
Actor(s): Registered User	
Main success scenarios	
Basic Flow	
1. User clicks "Forgot Password" on the login page 2. User enters their email address 3. System sends a password reset link to the user's email 4. User clicks the link and is redirected to reset their password 5. User sets a new password and submits 6. System updates the account with the new password	
Alternate Flows	
Title	**Description**
Email not linked to an account	• If the email is not linked to an account, the system informs the user • User tries re-enters a different email or chooses to register a new account • Basic flow resumes if the user re-enters a different email
Precondition(s)	
Title	**Description**
Account Existence	User must have an existing account.
Email Access	User must have access to the email associated with the account
Postcondition(s)	
Title	**Description**
Success	User successfully resets their password.
Fail	User enters an email not associated with any account, the system informs no account exists.

Provides a way for users to reset passwords. The process involves requesting a reset link and setting a new password, with the system updating the account. Alternate flow handles email addresses not linked to any account. Preconditions include existing account and email access.

Use Case 11: Adjust Email Notification Preferences

Use case name: Adjust Email Notification Preferences	
Brief description: Allows users to adjust their preferences for receiving email notifications.	
Actor(s): Registered user.	
Main success scenarios	
Basic Flow	
1. User logs in and navigates to the email preferences section in their account. 2. User selects or unselects types of email notifications they wish to receive (e.g., promotional offers, newsletters, order updates). 3. User saves their preferences. 4. System updates the user's email notification settings.	
Alternate Flows	
Title	**Description**
System error is encountered when updating preferences	• User encounters a system error while attempting to save preferences. • The system displays an error message and suggests trying again later. • User attempts to save the changes again after some time, or contacts customer support if the issue persists. • The basic flow resumes once the error is resolved.
Precondition(s)	
Title	**Description**
User Authentication	User must be logged in.
Email Subscription	User must be subscribed to email notifications.
Postcondition(s)	
Title	**Description**
Success	User successfully adjusts their email notification preferences.
Fail	System error prevents saving preferences; user is prompted to try again later.

Enables users to adjust email notification settings. Success includes changing preferences and system updates. An alternate flow involves encountering a system error, requiring retry or customer support. Preconditions include user authentication and email subscription.

Use case name: Product Sorting and Filtering	
Brief description: Allows users to sort and filter products based on various criteria.	
Actor(s): Site visitor (registered or unregistered)	
Main success scenarios	
Basic Flow	
1. User navigates to the product listing page. 2. User selects sorting criteria (e.g., price, popularity, new arrivals). 3. User selects filters (e.g., size, colour, brand). 4. System updates the product display based on selected criteria. 5. User browses the sorted and filtered products.	
Alternate Flows	
Title	**Description**
Filers result in no matching products	• User applies filters resulting in no matching products. • The system displays a message indicating no products match the criteria. • The system suggests removing or adjusting some filters. • User modifies the filter criteria, and the basic flow resumes from step 4.
Precondition(s)	
Title	**Description**
Product Listing Availability	Products must be listed and available for sorting and filtering.
Site Accessibility	Users need access to the website to view products.
Postcondition(s)	
Title	**Description**
Success	User successfully sorts and filters the product listing.
Fail	No products match the filtering criteria; the system displays a relevant message.

Allows users to sort and filter products on the website. Successful sorting and filtering are based on user-selected criteria, with system updates. An alternate flow occurs when filters yield no matching products, suggesting adjustments. Preconditions include product listing availability and site accessibility.

Use case name: Update User Profile	
Brief description: Allows users to update their personal profile information.	
Actor(s): Registered user.	
Main success scenarios	
Basic Flow	
1. User logs into their account. 2. User navigates to the profile page. 3. User selects the option to edit their profile. 4. User updates information (e.g., name, address, contact number). 5. User clicks the save button to update their profile. 6. System confirms the successful update	
Alternate Flows	
Title	**Description**
User enters invalid data	• If the user enters invalid data (e.g., incorrect phone format), the system displays an error message • User is prompted to correct the data • After correction, the user resubmits, and the basic flow resumes from step 5
Precondition(s)	
Title	**Description**
User authentication	The user must be logged in to access their profile.
Profile existence	The user must have an existing profile to update.
Postcondition(s)	
Title	**Description**
Success	User successfully updates their profile information.
Fail	User enters invalid data; the system displays an error and asks for correction.

Allows registered users to update their profile. Successful scenario includes user logging in, navigating to, and updating their profile, with system confirmation. Alternate flow addresses invalid data entry, requiring correction. Preconditions include user authentication and existing profile.

Use case name: Update User Profile	
Brief description: Allows users to update their personal profile information.	
Actor(s): Registered user.	
Main success scenarios	
Basic Flow	
1. User logs into their account. 2. User navigates to the profile page. 3. User selects the option to edit their profile. 4. User updates information (e.g., name, address, contact number). 5. User clicks the save button to update their profile. 6. System confirms the successful update	
Alternate Flows	
Title	**Description**
User enters invalid data	• If the user enters invalid data (e.g., incorrect phone format), the system displays an error message • User is prompted to correct the data • After correction, the user resubmits, and the basic flow resumes from step 5
Precondition(s)	
Title	**Description**
User authentication	The user must be logged in to access their profile.
Profile existence	The user must have an existing profile to update.
Postcondition(s)	
Title	**Description**
Success	User successfully updates their profile information.
Fail	User enters invalid data; the system displays an error and asks for correction.

Allows registered users to update their profile. Successful scenario includes user logging in, navigating to, and updating their profile, with system confirmation. Alternate flow addresses invalid data entry, requiring correction. Preconditions include user authentication and existing profile.

Use case name: Wishlist Creation and Management	
Brief description: Users can create and manage a wishlist of items.	
Actor(s): Logged in user	
Main success scenarios	
Basic Flow	
Wishlist reflects user's current selections and the user must be logged in as a pre-condition 1. User browses products and selects the "Add to Wishlist" button on desired items 2. System adds the items to the user's wishlist 3. User navigates to the wishlist page to review or modify their list 4. System displays current items in the wishlist 5. User can remove items or navigate to product pages from the wishlist	
Alternate Flows	
Title	**Description**
Stock issue with selected Item	• If the user selects an out-of-stock item, the system notifies the user • User is given the option to be notified upon restock or to select an alternative item • User makes a selection, and the basic flow resumes
Precondition(s)	
Title	**Description**
User Authentication	User must be logged in to access wishlist features.
Product Availability	Products intended for the wishlist must be listed on the site.
Postcondition(s)	
Title	**Description**
Success	User successfully creates and updates their wishlist.
Fail	User tries to add an unavailable item; the system shows an error or notification.

Enables logged-in users to create and manage a wishlist. Success involves adding items to the wishlist and managing them. Alternate flow covers stock issues with selected items, offering notifications or alternatives. Preconditions include user authentication and product availability.

Appendix 11: Functional Requirements

3.1 User Account Management

- **Requirement**: The website shall enable users to create, manage, and delete their personal accounts.
- **Rationale**: User accounts are fundamental to personalising the shopping experience. They facilitate the storage of user preferences, order history, and provide a personalised interaction with the website. This feature is crucial for building user loyalty and for providing tailored recommendations and services.
- **Justification**: By allowing users to manage their accounts, the website ensures a higher level of user engagement and satisfaction. It also aids in collecting valuable customer data for marketing and improvement of services.

3.2 Product Catalogue and Management

- **Requirement**: The website shall present a detailed and navigable catalogue of men's athleisure products.
- **Rationale**: A well-organised product catalogue is essential for enabling customers to easily browse and find products. It enhances user experience and is pivotal in guiding purchasing decisions.
- **Justification**: Including features such as categorisation, search, and filter functions makes the shopping process more efficient and user-friendly. For the business, it simplifies the management of product listings, ensuring that the catalogue remains up-to-date and accurate.

3.3 Shopping Cart and Checkout Process

- **Requirement**: The website shall incorporate a functional shopping cart and a secure checkout process.
- **Rationale**: The shopping cart is a key component of online shopping, allowing users to select and review products before purchase. A secure and streamlined checkout process is vital to minimise cart abandonment and ensure transaction security.
- **Justification**: Simplifying the checkout process reduces barriers to purchase, thereby potentially increasing sales. Security in transactions is paramount to maintain customer trust and meet regulatory requirements.

3.4 Order Tracking and History

- **Requirement**: The website shall offer capabilities for users to track their orders and access purchase history.
- **Rationale**: Post-purchase services like order tracking and purchase history enhance customer satisfaction and provide transparency in the shopping process.
- **Justification**: Providing users with the ability to track their orders fosters trust and reliability. Access to purchase history is not only convenient for users but also aids in generating repeat business by encouraging future purchases based on past preferences.

Appendix 12: Non-Functional Requirements

4.1 Usability

- **Requirement**: The website should be user-friendly, intuitive, and accessible to all users, including those with disabilities.
- **Rationale**: A high level of usability is essential to ensure that customers can easily navigate and interact with the website. This includes clear navigation, readable text, and intuitive layout.
- **Justification**: Enhanced usability aids in reducing user frustration, increasing customer satisfaction, and potentially boosting sales. It also aligns with legal requirements for digital accessibility.

4.2 Performance

- **Requirement**: The website should load quickly and perform efficiently under varying traffic conditions.
- **Rationale**: Performance impacts user experience and satisfaction. Fast load times and efficient performance are crucial in retaining user attention and reducing bounce rates.
- **Justification**: Optimal performance is essential for a positive user experience and can significantly affect search engine rankings, which are vital for online visibility.

4.3 Security

- **Requirement**: The website must ensure high levels of security, particularly in handling user data and payment transactions.
- **Rationale**: Security is paramount in protecting sensitive user information and maintaining customer trust. This includes data encryption, secure payment gateways, and compliance with data protection laws.
- **Justification**: Strong security measures are not only a legal requirement but also critical in building and maintaining customer trust and protecting the company from potential data breaches and legal issues.

4.4 Scalability

- **Requirement**: The website should be scalable, capable of handling increased traffic and expanding product ranges without performance degradation.
- **Rationale**: Scalability ensures the website can grow with the business, accommodating an increasing number of users and products without compromising on performance.
- **Justification**: Investing in scalable architecture minimises future redevelopment costs and ensures that the website can support business growth and evolving market demands.

4.5 Compatibility

- **Requirement**: The website should be compatible across various browsers, devices, and operating systems.
- **Rationale**: Users access websites from a multitude of devices and browsers. Ensuring compatibility across these platforms is essential for reaching a wider audience.
- **Justification**: Broader compatibility enhances user reach and engagement, directly impacting the website's effectiveness and the business's market presence.